

Efficient Battery Utilization by Offloading to Cloud based Web Services

Ankit Dayal, Suneet Shukla

Abstract: Cloud Computing improves the productivity of the system. In this technical era there is a great need of cloud computing & cloud storage as the applications are become layer & layer. As the application are become layer & android based so there is a need for the storage of the data as well as the cloud based servers. Cloud computing is the great option because of the ease. Of virtualization is provided, availability, less down (nearly negligible), less maintenance, easy recovery & very broad bandwidth. By shifting the application on the cloud we can save the energy of the mobile by offloading the partial application on the cloud based server.

Energy serving is the mobile which uses the offloaded application on the cloud is directly proportional to the connected time. The time of Network which we are using is also an important the energy Consumption is less in case of the wireless network, it is maximum when connected through 3G & it is moderate while using 2G we cant neglect the role of operating system for the Energy usage of the Mobile battery.

For example LINUX Server Consumer the less energy while the windows server may consume some more memory on the base of the data processing. If we increase the mobile RAM, it may also result in less energy Consumption. Base unit of data transfer is data packets. Energy Consumption of mobile is directly proportional to the packet size. The work will expose the benefits and possibilities of shifting mobile Computing to the cloud.

Keywords - energy consumption, cloud computing, smart phones, offloading, Wi-Fi, 3g, edge routers, core routers, base station, support nodes.

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I. INTRODUCTION

Cloud Computing improves the productivity of the system. In this technical era there is a great need of cloud computing & cloud storage as the applications are become layer & layer. As the applications are become layer & android based so there is a need for the storage of the data as well as the cloud based servers. Cloud computing is the great option because of the ease. Of virtualization is provided, availability, less down (nearly negligible), less maintenance, easy recovery & very broad bandwidth. By shifting the application on the cloud we can save the energy of the mobile by offloading the partial application on the cloud based server.

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II. FEATURES OF PROPOSED WORK

The proposed system is beneficial for any type of application working with Data mining, Hashing and Image Compression.

1. The application shows how offloading the Computational task in the field of Data Mining is beneficial.

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2. Many Hashing algorithms are proposed by the researchers. By the proposed work tried to prove that in mobile computing offloading is beneficial for battery usage also, Mobiles generally hangs on high computation on large hash table sizes.
3. Third problem proposed in the work of image compression. On offloading the compression on server is helpful for end users on the Mobile applications.

A. Datamining

Data mining is an important field of research work for researchers. There are many algorithms and techniques are available in the field of data mining. A successful company today has many decisions to make. The better those decisions are made, the more successful, and profitable, the company is. To many chief decision makers, the ability to analyze faster and better than the competition means better decisions, higher profitability, and more success. Mobile computing takes time to perform mining operations , so it is preferred to perform through the cloud.

B. Hashing

Hashes play a role in security systems where they're used to ensure that transmitted messages have not been tampered with. Hashing is a technique used (among other applications) to implement Java's common map and set classes. Hashing is designed to solve the problem of needing to efficiently find or store an item in a collection. Hashing means using some function or algorithm to map object data to some representative integer value. This so-called hash code (or simply hash) can then be used as a way to narrow down our search when looking for the item in the map. Hashing is used everywhere in computing and is getting increasingly important with the exploding amount of data.

C. Image Compression

The objective of image compression is to reduce irrelevance and redundancy of the image data in order to be able to store or transmit data in an efficient form. The images captured by the recent cameras often exceed 2 MB. Using such images frequently results in Out of Memory Error. Also, due to landscape/portrait orientation, the images often are displayed as rotated. To deal with these issues we need to compress the image and give proper rotation before loading it to memory. The proposed method compresses image (similar to whatsapp), while maintaining its aspect ratio and also preventing significant loss to its quality.

In the proposed work the image is first uploaded from sd-card to the server. Then compressed on the cloud

and last step is downloaded in the sdcard of the mobile.

III. OFFLOADING AND NO OFFLOADING SCENARIO

The client machine had a less powerful processor and RAM. The server machine emulating a cloud server was a more powerful machine with a high processing processor and higher RAM. The experiment for the no offloading scenario and for the offload scenario is done. In the no offload scenario the network part is not involved and so the total energy consumed by the client machine while performing the task will be the total energy of this scenario. In the offload scenario the network and server add to the energy consumed along with the client. So in order to find the total end-to-end energy consumed we need to find the energy consumed at the client, server and the network which carry out the offloading process from the client to the server. The application performed three different tasks, locally on the mobile phone and by offloading the tasks to the cloud. The tasks was timed which in turn will answer if it is faster to perform the functions locally, on the mobile phone, or if it is faster to use the cloud. As previously mentioned there are crucial factors like mobile phone computation capacity and network connection to consider.

IV. EXPERIMENTS AND RESULTS

The experimental results show that the total time consumption in an offloading scenario is effective in Mining and Hashing problems. According to the following results ,this work arrives to a conclusion that offloading a better-bet .

Dataset Limit	Cloud Time in Milli Sec.	Mobile Time in Milli Sec.
100 for Hashing	01	05
200 for Mining	03	09
2000 for Mining	06	12

V. APPLICATION

Mobile data offloading is the use of complementary network technologies for delivering data originally targeted for cellular networks. The developed system will mainly help mobile users to check whether the offloading any task will be beneficial or not. Time consumption in a smart phone when executing a computation for data mining, hashing searching from large dataset is troublesome for end users.

VI. CONCLUSION

Data mining, Hashing and Image Compression are important issues for researchers in mobile and cloud computing. This paper is proposed to conclude that these operations must be offloaded for better results.

Time consumption in a smart phone when executing a computation intensive task versus. End-to-end time consumption when the same task is offloaded to a remote server. The results show that, energy consumed for a computation intensive task in a no-offloading scenario is much higher compared to the energy consumed for executing the same task in an offloading scenario. Also, the magnitude of energy savings increases as the complexity of task increases. A major portion of energy consumption in offloading scenario was consumed by the client device. The possibility to share files with other devices are another. A disadvantage is that third-party organizations might be able to access the files, as they are stored on their servers. Cloud server uptime is another concern. If a mobile phone application relies on cloud computing to work, and the cloud servers are down for maintenance, then the application will be useless. Cloud computing brings a lot of opportunities. All new technology has side-effects and drawbacks. Today there are already quite many mobile phone applications that use cloud computing to some extent and there is nothing that point to a decline in this trend. In Data mining, clustering is the process of organizing similar objects into groups called clusters. In other words cluster is a collection of similar objects.

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